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10/055,560	01/22/2002	Mou-Shiung Lin	MEGP0009USA	6103
27765	7590	03/19/2008		
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION				
P.O. BOX 506				
MERRIFIELD, VA 22116				
EXAMINER				
MITCHELL, JAMES M				
ART UNIT		PAPER NUMBER		
2813				
NOTIFICATION DATE		DELIVERY MODE		
03/19/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/055,560

Applicant(s)

LIN ET AL.

Examiner

JAMES M. MITCHELL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 242-248 and 250-274 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 242-247, 250-259 and 261-274 is/are rejected.
- 7) ☒ Claim(s) 248 and 260 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to applicant's amendment filed August 21, 2007.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 244 and 269-271 are rejected under 35 U.S.C. 102(b) as being anticipated by Saia et al. (U.S. 5,874,770).

5. Saia (Fig. 8, 12) discloses:

(cl. 244) A method for fabricating a chip package comprising: providing a first die (44) having a first top surface at a horizontal level and a second die having a second top surface at said horizontal level (Col. 7, Lines 7-10); forming a passive device (37) over said horizontal level, wherein said passive device is entirely not directly over said first and second dies (e.g. to left or right); after said forming said passive device over said horizontal level, forming an insulating layer (54) on said passive device; and forming a patterned circuit layer (46/ 47) over said horizontal level, wherein said patterned circuit layer_metal trace extends across an edge of said first die (stretches across horizontal outer surface of a chip and therefore an edge);

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(cl. 269, 270) wherein said depositing said metal trace comprises electroplating/sputtering (Col. 7, Lines 52-55);

(cl. 271) the passive component comprises an electroplating process (Col.5, Lines 25-30).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 273 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saia et al. (U.S. 5,874,770) in combination with Tabrizi (U.S. 6,867,499).

8. Saia discloses the elements stated in paragraph 5 of this office action, but fails to explicitly disclose use of solder bump over horizontal level.

9. Tabrizi utilizes a solder bump (21) over a horizontal level (e.g. above chip).

10. It would have been obvious to one of ordinary skill in the art to incorporate use of a solder bump above the horizon level of Saia in order to provide a mount the device as taught by Tabrizi (Col. 2, Lines 47-50).

11. Claims 242-244, 254, 256, 261, 266 and 268 are under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499).

12. Tabrizi (Fig. 2, 4, 5) discloses a chip packaging method comprising joining at least a die (520) and a substrate (500), said die having a top horizontal level, wherein

said die and said substrate are under said horizontal level, after joining, depositing metallization/ trace (560)/forming a patterned layer over said horizontal level extending across an edge of said die (e.g. above chip and past right and left vertical sidewall of chip), forming a passive device over the said substrate, horizontal level and forming an insulation on said passive component (e.g. in "redistribution or additional dielectric"; Col. 5, Lines 1-4) layer, and separating said substrate ("form multiple electronic components"; Col. 1, Lines 45-46); with the passive over the horizontal (e.g. passive in redistribution layer, 560,570 and therefor includes passive components connected to both the bump and chip at contact points); and depositing a dielectric (passivation not labeled covering pad, 540 & 550, 570) over horizontal followed by at least one trace (120); whereby said trace extends to a place under which said die does not exist (e.g. wiring connected to outermost balls, 580 that extends past die);

(cl. 266) solder bump (21) formed over horizontal level;

(cl. 256, 268) forming metal bump is followed by separating said substrate (e.g. Fig. 2).

13. Tabrizi does not appear to explicitly disclose that its passive is entirely not directly over (e.g. understood to mean to left or right) said die.

14. However since placement of a capacitor to either the left or right of die would not modify the operation of the device and applicant has not disclosed that the placement is for any unobvious or critical reasons, the rearrangement of the capacitor would have been obvious since it has been held that the mere shifting of parts without providing modification to the device are obvious. See e.g. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except

with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device.); In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice).

15. Furthermore, having a portion of a passive component not over the die is analogous to merely changing the size/ configuration of the passive component. Applicant has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result. As such, changing the size/configuration of the passive component would have been obvious to one of ordinary skill in the art, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

16. Claims 245 and 257 are under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Towle et al. (U.S. 2002/0074641).

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17. Tabrizi discloses the elements stated in paragraphs 12-15 of this office action, but does not appear to disclose a metal substrate.

18. Towle teaches a metal substrate metal ("heat spreader...copper"; Par. 0038).

19. It would have been obvious to one of ordinary skill in the art to incorporate a metal substrate in to provide heat dissipation as taught by Towle (Par. 0038).

20. Claims 250-253 and 262-625 are under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Saia et al. (U.S. 5,874,770).

21. Tabrizi discloses the elements stated in paragraphs 12-15 of this office action, but fails to explicitly disclose use of electroplating or sputtering.

22. Saia teaches use of electroplating and sputtering (Col. 5, Lines 25-30 & Col. 7, Lines 52-55).

23. It would have been obvious to one of ordinary skill in the art to incorporate use of electroplating or sputtering in order to provide metallization on a surface as taught by Saia (e.g. 21).

24. Claims 246, 247, 258 and 259 are under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Farquhar et al. (U.S. 6,329,713).

25. Tabrizi discloses the elements stated in paragraph 12-15 of this office action, but fails to disclose its chip support being formed by joining a metal film and substrate, an opening formed by punching in said film and joining a die to the exposed substrate.

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26. However, Farquhar (Col. 4, Lines 9-274) utilizes a support being formed by joining a film (1) and substrate (8), an opening formed by punching in said film and joining a die (to the exposed substrate).

27. It would have been obvious to one of ordinary skill in the art to modify the substrate of Tabrizi by incorporating the process of Farquhar in order to provide heat dissipation through use of a heat sink as taught by Farquhar (Col.3, Lines 67).

28. Claims 255 and 274 are rejected under 35 U.S.C. 103(a) as being unpatentable Tabrizi (U.S. 6,867,499) in combination over Nuytkens et al. (U.S. 6,838,750).

29. Tabrizi discloses the elements of paragraph 12-15 of this office action, but does not show its bumps being gold.

30. However Tabrizi discloses the same invention except that connection is made through solder instead of gold, Nuytkens (Col. 1, Lines 50-51 & Col. 7. Lines 2-3) shows use of solder and gold to form equivalent bump structure known in the art. Therefore, because these two contact structures are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute gold for solder.

31. Similarly the selection of gold for bumps is known in the art as evidenced by Nuytkens. As such the selection of gold for bumps would have been obvious to one of ordinary skill in the art, since it has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness

determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Allowable Subject Matter

32. Claims 248 and 260 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

33. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make forming a, opening in a metal film through punching including all the limitations of the independent claim. In contrast the metal film is used in the prior art as a support fully covering the chip without an opening to optimize heat dissipation.

Response to Arguments

34. Applicant's arguments with respect to the amendment of the claims have been considered but are moot in view of the new ground(s) of rejection. However in an effort to expedite prosecution of the application examiner has addressed some arguments that still may be relevant.

35. With respect to Tabrizi, applicant attempts to establish that a rearrangement modifies the device, because allegedly interference is reduced the farther it is away from the chip component; this is not an unexpected result. Applicant's mere shifting of a

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component does not rise to the level of invention for which the patents are granted¹. No criticality or unexpected results has been established by applicant.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art discloses in: Yamakawa (JP05114665) the use of laminated substrates to provide heat dissipating means; Akram et al. (U.S. 2002/0127771) rearrangement of passive components; and in Saia'908 (U.S. 5,973,908) passive components entirely formed not over a die.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. MITCHELL whose telephone number is (571)272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

¹ See for e.g. Akram et al. (U.S. 2002/0127771) showing passive component placed in various parts of package.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl Whitehead Jr./
Supervisory Patent Examiner, Art
Unit 2813

Ex. Mitchell
March 3, 2008
/James M. Mitchell/
Examiner, Art Unit 2813